WHAT IS CLAIMED IS:

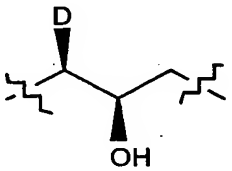
1. An HIV protease inhibitor represented by a formula:

X-A-B-A'-X'

wherein

X is a 5-7 membered non-aromatic monocyclic heterocycle, wherein said heterocycle is optionally fused or bridged with one or more 3-7 membered non-aromatic monocyclic heterocycle to form a polycyclic system, wherein any of said heterocyclic ring systems contains one or more heteroatoms selected from O, N, S, or P; wherein any nitrogen forming part of the heterocycles may optionally be substituted by R2, R3, R6, R7 or O; wherein any sulfur may be optionally be substituted by one or two oxygen atoms; wherein any P may be optionally be substituted by one or more of O NR2, or S, and any of said ring systems optionally contains 1 to 6 substituents selected from the group consisting of R2, R3, R5, and R6;

A is ZCZNH, ZCOCONH, $ZS(O)_2NH$, ZP(O)(V)NH, CONH, COCONH, $S(O)_2NH$, P(O)(V)NH, wherein Z is NR2, O, S, or $C(R2)_2$, and V is OR2 or NR2;

B is 

, wherein D is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, or aralkyl optionally substituted with one or more groups selected from alkyl , halo, nitro, cyano, CF_3, C3-C7 cycloalkyl, C5-C7 cycloalkenyl, R6, OR2, SR2, NHR2, OR3, SR3, NHR3, OR6, SR6, or NHR6;

A' is N(D')E', wherein D' is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, or aralkyl optionally substituted by alkyl, halo, nitro, cyano, CF_3, O-alkyl, or S-alkyl, and E' is -CO- or -SO_2-;

X' is selected from the group consisting of aryl and heteroaryl, which are substituted with one or more of the following groups:

OR3, OR6, OR7, OR2 provided R2 is not H or unsubstituted alkyl;

alkyl substituted by R3, R5, R6 provided R5 is not halo;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from R5;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl substituted by R2, R3, R5, R6; provided R2 is not H;

CO_2H or R7; provided R8 is not H or unsubstituted alkyl;

NR8R8, NR7R8, NR7R7; provided R8 is not H or unsubstituted alkyl;

$SO_nN(R8)_2$, SO_nNR7R8, SR8, $S(O)_nR8$, provided R8 is not H or methyl; and n is 1 or 2;

R is H or alkyl, aryl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, heterocyclo, heteroaryl; optionally substituted by halo, hydroxy, alkoxy, aryloxy, cycloalkoxy, heteroaryloxy, cyano, nitro, alkylthio, arylthio, cycloalkylthio, amino, or mono- or dialkylamino, mono- or diarylamino, mono- or di-cycloalkylamino, mono- or di-heteroarylamino, alkanoyl, cycloalkanoyl, aroyl, heteroaroyl, carboxamido, mono- or dialkylcarboxamido, mono- or diarylcarboxamido, sulfonamido, mono- or dialkylsulfonamido, mono- or diarylsulfonamido, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, cycloalkylsulfinyl, cycloalkylsulfonyl, heteroarylsulfinyl, heteroarylsulfonyl;

R2 is H or C1-C6 alkyl; optionally substituted by C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, heterocyclo; which groups may be optionally substituted with one or more substituents selected from the group consisting of halo, OR, ROH, R-halo, NO_2, CN, CO_nR, $CON(R)_2$, C(S)R, $C(S)N(R)_2$, $SO_nN(R)_2$, SR, SO_nR, $N(R)_2$, $N(R)CO_nR$, $NRS(O)_nR$, $NRC[=N(R)]N(R)_2$, $N(R)N(R)CO_nR$, $NRPO_nN(R)_2$, $NRPO_nOR$, oxo, =N-OR , $=N-N(R)_2$, =NR, $=NNRC(O)N(R)_2$, $=NNRCO_nR$, $=NNRS(O)_nN(R)_2$, or $=NNRS(O)_n(R)$;

or R2 is C1-C6 alkyl; substituted by aryl or heteroaryl; which groups may be optionally substituted with one or more substituents selected from the group consisting of halo, OR, ROH, R-halo, NO_2, CN, CO_nR, $CON(R)_2$, C(S)R, $C(S)N(R)_2$, $SO_nN(R)_2$, SR, SO_nR, $N(R)_2$, $N(R)CO_nR$, $NRS(O)_nR$, $NRC[=N(R)]N(R)_2$, $N(R)N(R)CO_nR$, $NRPO_nN(R)_2$, $NRPO_nOR$;

or R2 is C1-C6 alkyl; optionally substituted by halo, OR, ROH, R-halo, NO_2, CN, CO_nR, $CON(R)_2$, C(S)R, $C(S)N(R)_2$, $SO_nN(R)_2$, SR, SO_nR, $N(R)_2$, $N(R)CO_nR$, $NRS(O)_nR$, $NRC[=N(R)]N(R)_2$, $N(R)N(R)CO_nR$, $NRPO_nN(R)_2$, $NRPO_nOR$, oxo, =N-OR , $=N-N(R)_2$, =NR, $=NNRC(O)N(R)_2$, =NNRCOnR, $=NNRS(O)nN(R)_2$, or =NNRS(O)n(R);

R3 is C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, or heterocyclo; which groups may be optionally substituted with one or more substituents selected from the group consisting of halo, OR2, R2-OH, R2-halo, NO_2, CN, CO_nR2, $C(O)N(R2)_2$, $C(O)N(R2)N(R2)_2$, C(S)R2, $C(S)N(R2)_2$, $S(O)nN(R2)_2$, SR2, SO_nR2, $N(R)_2$, $N(R2)CO_nR2$, $NR2S(O)_nR2$, $NR2C[=N(R2)]N(R2)_2$, $N(R2)N(R2)CO_nR2$, $NR2PO_nN(R2)_2$, $NR2PO_nOR2$, oxo, =N-OR2 , $=N-N(R2)_2$, =NR2, $=NNRC(O)N(R2)_2$, $=NNR2C(O)_nR2$, $=NNR2S(O)_nN(R2)_2$, or $=NNR2S(O)_n(R2)$;

R4 is halo, OR8, R2-OH, R3-OH, R2-halo, R3-halo, NO_2, CN, CO_nR8, CO_nR8, $CON(R8)_2$, $C(O)N(R8)N(R8)_2$, C(S)R8, $C(S)N(R8)_2$, $SOnN(R8)_2$, SR8, SO_nR8, $N(R8)_2$, $N(R8)CO_nR8$, $NR8S(O)_nR8$, $NR8C[=N(R8)]N(R8)_2$, $N(R8)N(R8)CO_nR8$, $NR8PO_nN(R8)_2$, $NR8PO_nOR8$, OC(O)R2, OC(S)R8, $OC(O)N(R8)_2$, $OC(S)N(R8)_2$, $OPO_n(R8)_2$;

R5 is OR8, $N(R8)_2$, NHOH, N(R8)COR8, $NR8S(O)_nR8$, $NR8C[=N(R8)]N(R8)_2$, $N(R8)N(R8)C(O)R8$, $NR8PO_nN(R8)_2$, $NR8PO_nOR8$, R2OH, R3-OH, R2-halo, R3-halo, CN, CO_nR8; provided that when n = 2, R8 is not H; $CON(R8)_2$, $C(O)N(R8)N(R8)_2$, $C(S)_nR8$, $C(S)N(R8)_2$, $S(O)_nR8$, $SO_nN(R8)_2$, halo, NO_2, SR8, oxo, =N-

OH , =N-OR8, =N-N(R8)$_2$, =NR8, =NNR8C(O)N(R8)$_2$, =NNR8C(O)$_n$R8, =NNR8S(O)$_n$N(R8)$_2$, or =NNR8S(O)$_n$(R8), or R3

R6 is aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from aryl, heteroaryl, R2, R3, halo, OR2, R2OH, R2-halo, NO$_2$, CN, CO$_n$R2, C(O)N(R2)$_2$, C(O)N(R2)N(R2)$_2$, C(S)R2, C(S)N(R2)$_2$, S(O)$_n$N(R2)$_2$, SR2, SO$_n$R2, N(R)$_2$, N(R2)CO$_n$R2, NR2S(O)$_n$R2, NR2C[=N(R2)]N(R2)$_2$, N(R2)N(R2)CO$_n$R2, NR2PO$_n$N(R2)$_2$, NR2PO$_n$OR2, OC(O)R2, OC(S)R2, OC(O)N(R2)$_2$, OC(S)N(R2)$_2$, OPO$_n$(R2)$_2$

R7 is C(O)$_n$R8; provided that when n = 2; R8 is not H; C(S)R8, C(O)N(R8)$_2$, C(S)N(R8)$_2$, S(O)$_n$R8, S(O)nN(R8)$_2$;

R8 is R2, R3, or R6;

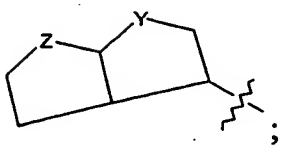
each n is independently 1 or 2;

its stereoisomeric forms; and

its pharmacologically acceptable salts.

2. The compound according to claim 1, wherein

X is



;

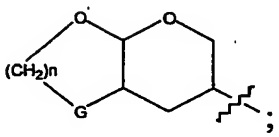
Y is O, NH, or S;

Z is O, NH, or S; and

wherein any ring carbon is optionally substituted by R2, R3, R5, or R6..

3. The compound according to claim 1, wherein

X is



;

wherein

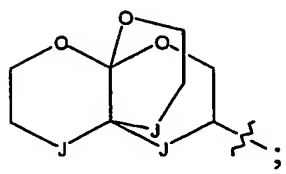
G is C, O, NR2, or S;

n is an integer between 1-2; and

wherein any ring carbon is optionally substituted by R2, R3, R5, or R6.

4. The compound according to claim 1, wherein

X is



;

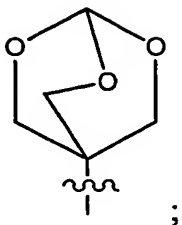
wherein

J is independently CH_2, or O, and

wherein any ring carbon is optionally substituted by R2, R3, R5, or R6.

5. The compound according to claim 1, wherein:

X is

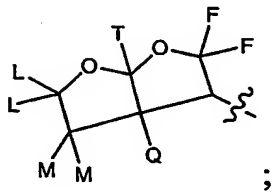


;

wherein any ring carbon is optionally substituted by R2, R3, R5, or R6.

6. The compound according to claim 1, wherein

X is



;

wherein

each L is independently H, lower alkyl, oxo, or L forms a carbocyclic or heterocyclic ring with M;

each M is independently H, OH, chloro, fluoro, or M forms a carbocyclic or heterocyclic ring with Q, provided that if one M is OH, the other M is not OH;

Q is H, OH, amino, lower alkyl, alkylamino, alkoxy, halo, or forms a 3-7-membered carbocyclic or heterocyclic ring together with T;

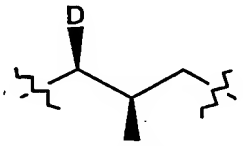
each F is independently H, OH, lower alkyl, halo, or spirocylopropyl, provided that if one R is OH, the other R is not OH;

T is H or F, or T forms a carbocyclic or heterocyclic ring together with F.

7. The HIV protease inhibitor according to claim 1, wherein

X is tetrahydrofurodihydrofuranyl, tetrahydrofurotetrahydrofuranyl, tetrahydropyranotetrahydrofuranyl or tetrahydropyranodihydrofuranyl;

A is OCONH;

B is 

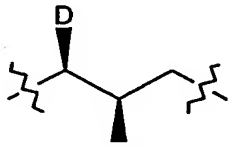
, wherein D is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, or aralkyl optionally substituted with one or more groups selected from alkyl , halo, nitro, cyano, CF_3, C3-C7 cycloalkyl, C5-C7 cycloalkenyl, R6, OR2, SR2, NHR2, OR3, SR3, NHR3, OR6, SR6, or NHR6; and

A' is N(D')E', wherein D' is alkyl, alkenyl, alkynyl aryl, cycloalkyl, or aralkyl optionally substituted by alkyl, halo, or CF_3, and E' is $-SO_2-$.

8. The HIV protease inhibitor according to claim 1, wherein:

X is tetrahydrofurotetrahydrofuranyl;

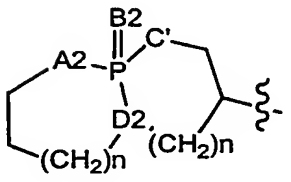
A is OCONH;

B is 

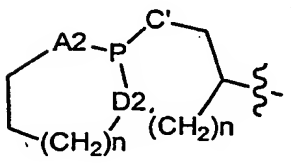
, wherein D is benzyl; and

A' is N(D')E', wherein D' is isobutyl and E' is $-SO_2-$;

9. The HIV protease inhibitor according to claim 1, wherein X is



or



;

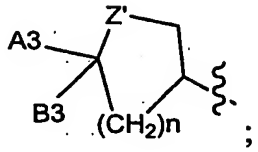
wherein A2, B2, and C' are each independently O, NR2, or S;

D2 is CH or N; and

n is an integer between 1 and 2.

10. The HIV protease inhibitor according to claim 1, wherein:

X is



;

wherein

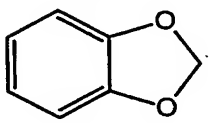
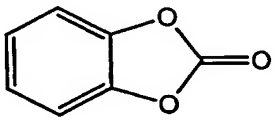
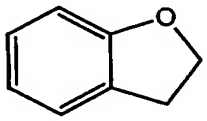
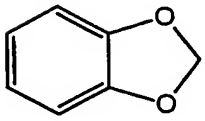
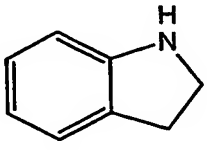
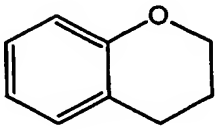
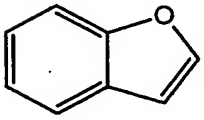
A3 is H, F or alkoxy;

B3 is F, alkoxy, lower alkyl, or A3 and B3 can form a 3-7 membered heterocyclic ring;

Z' is O, NR2, or S; and

n is an integer between 1-3.

11. The HIV protease inhibitor of claim 1, wherein X' is selected from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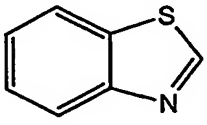

;

wherein said groups are substituted with one or more of the following groups:

OR3, OR6, OR7, OR2 provided R2 is not H or unsubstituted alkyl;

alkyl substituted by R3, R5, R6 provided R5 is not halo;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from R5;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

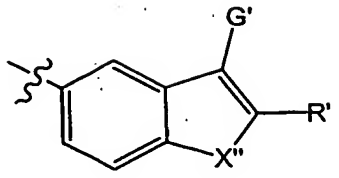
C3-C7 cycloalkyl substituted by R2, R3, R5, R6; provided R2 is not H;

CO_2H or R7; provided R8 is not H or unsubstituted alkyl;

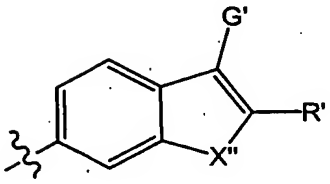
NR8R8, NR7R8, NR7R7; provided R8 is not H or unsubstituted alkyl; and

$SO_nN(R8)_2$, SO_nNR7R8, SR8, $S(O)_nR8$, provided R8 is not H or methyl; and n is 1 or 2.

12. The HIV protease inhibitor of claim 1, wherein X' is selected from



or



;

wherein

G' and R' cannot both be H;

G' and R' are each independently:

H or alkyl substituted by R3, R5, R6 provided R5 is not halo;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from the group consisting of -OR2, $C(O)N(R2)_2$, $S(O)_nN(R2)_2$, CN, SR2, SO_nR2, COR2, CO_2R2 or NR2C(O)R2, R5, and R7;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl substituted by R2, R3, R5, R6; provided R2 is not H;

CO_2H or R7 provided R2 is not H or unsubstituted alkyl;

$SO_nN(R8)_2$, SO_nNR7R8, SR8, $S(O)_nR8$, provided R8 is not H or methyl; and n is 1 or 2;

and X" is selected from O or NR'';

wherein R'' is

H or alkyl optionally substituted by R3, R5, R6;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from the group consisting of -OR2, $C(O)N(R2)_2$, $S(O)_nN(R2)_2$, CN, SR2, SO_nR2, COR2, CO_2R2 or NR2C(O)R2, R5, and R7;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl optionally substituted by R2, R3, R5, R6;

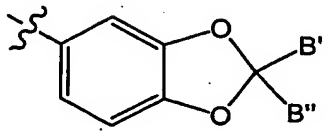
R7;

NR3R3, NR6R6, NR7R7, NR3R6, NR6R7, NR3R7, NR2R3, NR2R6, NR2R7, NR2R2;

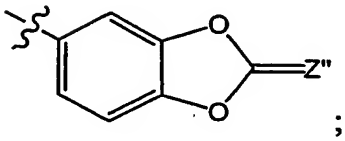
$SO_nN(R2)_2$, $SO_nN(R3)_2$, $SO_nN(R6)_2$, $SO_nN(R7)_2$, SO_nNR2R3, SO_nNR2R6, SO_nNR2R7, SO_nNR3R6, SO_nNR3R7, SO_nNR6R7;

$S(O)_mR2$, $S(O)_mR3$, $S(O)_mR6$, provided R2 is not H; and m is 0, 1 or 2.

13. The HIV protease inhibitor of claim 1, wherein X' is selected from



or



;

wherein

B' and B" cannot both be H or methyl;

B' and B" are independently:

H or alkyl optionally substituted by R3, R5, R6;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from the group consisting of -OR2, $C(O)N(R2)_2$, $S(O)_nN(R2)_2$, CN, SR2, SO_nR2, COR2, CO_2R2 or NR2C(O)R2, R5, and R7;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl optionally substituted by R2, R3, R5, R6;

CO_2H or R7;

$SO_nN(R2)_2$, $SO_nN(R3)_2$, $SO_nN(R6)_2$, $SO_nN(R7)_2$, SO_nNR2R3, SO_nNR2R6, SO_nNR2R7, SO_nNR3R6, SO_nNR3R7, SO_nNR6R7;

$S(O)_mR2$, $S(O)_mR3$, $S(O)_mR6$; and m is 0, 1 or 2;

Z" is O, NR9;

R9 is

alkyl optionally substituted by R3, R5, R6;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from the group consisting of -OR2, $C(O)N(R2)_2$, $S(O)_nN(R2)_2$, CN, SR2, SO_nR2, COR2, CO_2R2 or NR2C(O)R2, R5, and R7;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl optionally substituted by R2, R3, R5, R6;

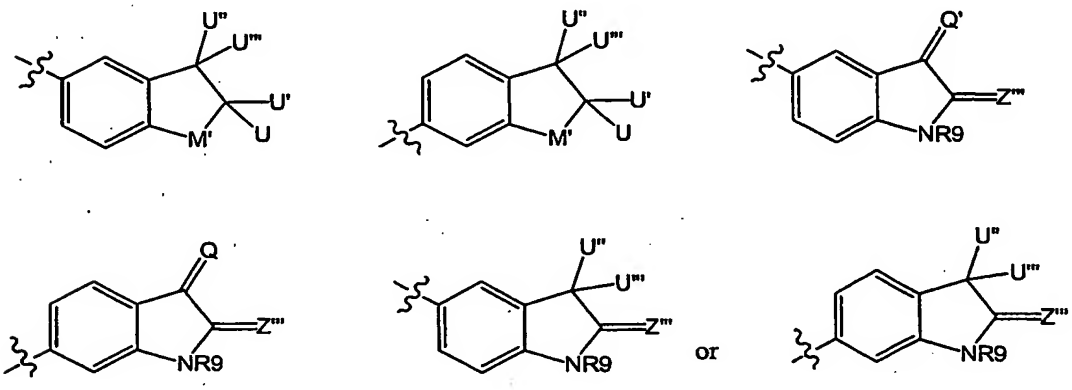
CO_2H or R7;

NR3R3, NR6R6, NR7R7, NR3R6, NR6R7, NR3R7, NR2R3, NR2R6, NR2R7, NR2R2;

$SO_nN(R2)_2$, $SO_nN(R3)_2$, $SO_nN(R6)_2$, $SO_nN(R7)_2$, SO_nNR2R3, SO_nNR2R6, SO_nNR2R7, SO_nNR3R6, SO_nNR3R7, SO_nNR6R7;

$S(O)_mR2$, $S(O)_mR3$, $S(O)_mR6$, provided R2 is not H; and m is 0, 1 or 2.

14. The HIV protease inhibitor of claim 1, wherein X' is selected from



wherein

U and U' are each independently

H or alkyl substituted by R3, R5, R6;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from the group consisting of -OR2, $C(O)N(R2)_2$, $S(O)_nN(R2)_2$, CN, SR2, SO_nR2, COR2, CO_2R2 or NR2C(O)R2, R5, and R7;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl substituted by R2, R3, R5, R6;

CO_2H, R7;

$SO_nN(R2)_2$, $SOnN(R3)_2$, $SO_nN(R6)_2$, $SO_nN(R7)_2$, SO_nNR2R3, SO_nNR2R6, SO_nNR2R7, SO_nNR3R6, SO_nNR3R7, SO_nNR6R7, wherein n= 1or 2;

$S(O)_mR2$, $S(O)_mR3$, $S(O)_mR6$, provided R2 is not H; and n is 0, 1 or 2;

U'' and U''' are each independently

H, OR3, OR6, OR7, OR2;

alkyl substituted by R3, R5, R6;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from the group consisting of -OR2, $C(O)N(R2)_2$, $S(O)_nN(R2)_2$, CN, SR2, SO_nR2, COR2, CO_2R2 or NR2C(O)R2, R5, and R7;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl substituted by R2, R3, R5, R6;

CO_2H or R7;

NR3R3, NR6R6, NR7R7, NR3R6, NR6R7, NR3R7, NR2R3, NR2R6, NR2R7, NR2R2;

$SO_nN(R2)_2$, $SO_nN(R3)_2$, $SO_nN(R6)_2$, $SO_nN(R7)_2$, SO_nNR2R3, SO_nNR2R6, SO_nNR2R7, SO_nNR3R6, SO_nNR3R7, SO_nNR6R7;

$S(O)_mR2$, $S(O)_mR3$, $S(O)_mR6$, provided R2 is not H; and m is 0, 1 or 2;

U and U' cannot both be H unless one of U'' and U''' is not H;

U'' and U''' cannot both be H unless one of U and U' is not H;

M' is O, NR9, or NH, except where R9 is CO_2H

Z''' is O or NR9

Q' is O, NR9, or CU''U''';

R9 is

alkyl optionally substituted by R3, R5, R6;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from the group consisting of -OR2, $C(O)N(R2)_2$, $S(O)_nN(R2)_2$, CN, SR2, SO_nR2, COR2, CO_2R2 or NR2C(O)R2, R5, and R7;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl optionally substituted by R2, R3, R5, R6;

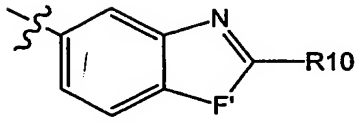
CO_2H or R7;

NR3R3, NR6R6, NR7R7, NR3R6, NR6R7, NR3R7, NR2R3, NR2R6, NR2R7, NR2R2;

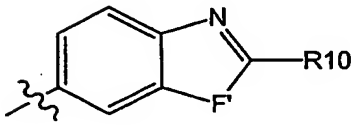
$SO_nN(R2)_2$, $SO_nN(R3)_2$, $SO_nN(R6)_2$, $SO_nN(R7)_2$, SO_nNR2R3, SO_nNR2R6, SO_nNR2R7, SO_nNR3R6, SO_nNR3R7, SO_nNR6R7;

$S(O)_mR2$, $S(O)_mR3$, $S(O)_mR6$, provided R2 is not H; and m is 0, 1 or 2.

15. The HIV protease inhibitor of claim 1, wherein X' is selected from



or



;

wherein

R10 is

alkyl substituted by R3, R5, R6 provided R5 is not halo;

C2-C6 alkenyl, C2-C6 alkynyl, C3-C8 cycloalkyl, C5-C8 cycloalkenyl, and heterocyclo, which groups may be optionally substituted with one or more substituents selected from the group consisting of -OR2, $C(O)N(R2)_2$, $S(O)_nN(R2)_2$, CN, SR2, SO_nR2, COR2, CO_2R2 or NR2C(O)R2, R5, and R7;

aryl or heteroaryl, wherein said aryl or heteroaryl may be optionally substituted with one or more groups selected from the group consisting of aryl, heteroaryl, R2, R3, R4, and R6;

C3-C7 cycloalkyl substituted by R2, R3, R5, R6; provided R2 is not H;

R7 provided Z is N, O, S and provided R2 is not H or unsubstituted alkyl; and

F' is O or S.

16. A compound according to claim 1, bound in a complex with wild type or drug resistant mutant forms of HIV-1 protease.

17. A pharmaceutical composition comprising an effective amount of an inhibitor according to claim 1 and a pharmaceutically acceptable additive, excipient, or diluent.

18. A pharmaceutical composition comprising an effective amount inhibitor according to claim 1 and another antiretroviral agent.

19. A pharmaceutical composition comprising an effective amount of an inhibitor according to claim 1 and a second HIV inhibitor.

20. A pharmaceutical composition comprising an inhibitor according to claim 1 and an additional HIV protease inhibitor.

21. A pharmaceutical composition comprising an effective amount of an inhibitor according to claim 1 and an HIV reverse transcriptase inhibitor.

22. A method of treating a patient suffering from HIV infection, comprising administering to said patient a composition according to claim 1.

23. A method of treatment according to claim 22 wherein said patient is suffering from a multi-drug resistant HIV infection.

24. An HIV protease inhibitor having the formula I:

X-A-B-A'-X' **I**

wherein X is a moiety comprising first and second hydrogen bond acceptor atoms H_{A1}:**X** and H_{A2}:**X**, wherein H_{A1}:**X** forms a hydrogen bond with N29 of HIV protease and H_{A2}:**X** forms a hydrogen bond with N30 of HIV protease at the relative positions designated in Table 8;

wherein A is an optionally substituted linker moiety comprising a linear chain of 2-6 atoms, wherein A comprises a hydrogen bond acceptor atom H_A:**A**, and a hydrogen bond donor atom H_D:**A**, and wherein H_A:**A** forms a hydrogen bond with solvated water301 of said protease at a relative position designated by O301, and HD:A forms a hydrogen bond with the backbone CO atom of residue 27 of said protease at a relative position designated by O27;

wherein B comprises a hydrogen bond donor or acceptor atom $H_{D/A}$:**B**, wherein $H_{D/A}$:**B** forms a hydrogen bond with either or both carboxylate side chain oxygens of Asp25 and Asp 125 of said protease at relative positions designated by OD1 25, OD2 25, OD1 125, and OD2 125;

wherein A' is an optionally substituted linker moiety comprising a linear chain of 2-6 atoms, comprising a hydrogen bond acceptor atom H_A:**A'**, wherein H_A:**A'** forms a hydrogen bond with solvated water301 of said protease at a relative position designated by O301; and

wherein X' is a moiety comprising a hydrogen bond acceptor atom H_A:**X'**, wherein H_A:**X'** forms a hydrogen bond with backbone NH atoms of residues 129 and/or 130 of said protease at relative positions designated by N129 and/or N130.

25. A compound according to claim 24, bound in a complex with wild type or drug resistant mutant forms of HIV-1 protease.

26. A pharmaceutical composition comprising an effective amount of an inhibitor according to claim 24 and a pharmaceutically acceptable additive, excipient, or diluent.

27. A pharmaceutical composition comprising an effective amount inhibitor according to claim 24 and another antiretroviral agent.

28. A pharmaceutical composition comprising an effective amount of an inhibitor according to claim 24 and a second HIV inhibitor.

29. A pharmaceutical composition comprising an inhibitor according to claim 24 and an additional HIV protease inhibitor.

30. A pharmaceutical composition comprising an effective amount of an inhibitor according to claim 24 and an HIV reverse transcriptase inhibitor.

31. A method of treating a patient suffering from HIV infection, comprising administering to said patient a composition according to claim 24.

32. A method of treatment according to claim 31 wherein said patient is suffering from a multi-drug resistant HIV infection.